

CLAIMS

1. A quick-connect coupling comprising:
a coupling body in which an end part, provided with an annular ridge, of a tube is inserted; and
a retainer to be inserted through a window into the coupling body in a direction perpendicular to the axis of the coupling body so as to engage with the annular ridge to retain the end part of the tube in the coupling body;
wherein the retainer engages with the annular ridge to retain the tube in the coupling body,
complete connection verifying members are formed in combination with the retainer to enable the retainer to be pressed through the window into the coupling body only after the annular ridge of the end part of the tube inserted in the coupling body has advanced beyond a position where the retainer is able to engage with the annular ridge.
2. The quick-connect coupling according to claim 1, wherein the complete connection verifying members are formed integrally with the retainer.
3. The quick-connect coupling according to claim 2, wherein the coupling body has a blocking part that engages with the complete connection verifying members to restrain the complete connection verifying members from being pressed into the coupling body in a state where the tube is improperly inserted in the coupling body.
4. The quick-connect coupling according to claim 3, wherein the retainer has a rib having an inner end surface that engages with the annular ridge of the tube to retain the annular ridge in place and locking legs respectively having locking hooks that engage with side walls of the coupling body, respectively, and the complete connection verifying members extend along the locking legs of the retainer and are provided at their free ends with hooks capable of coming into contact with the blocking part, respectively.
5. The quick-connect coupling according to claim 4, wherein the hooks of the complete connection verifying

members are provided with notches in which ends of the blocking part engage.

6. The quick-connect coupling according to claim 4, wherein the coupling body has backup parts for supporting the rib when a pulling force is exerted on the tube connected to the coupling body in a direction to pull the tube off the coupling body and an outer end surface opposite the inner end surface in engagement with the annular ridge to retain the tube in the coupling body is pressed against thereto.

7. The quick-connect coupling according to claim 4, wherein the complete connection verifying members have a strength such that the hooks of the complete connection verifying members cannot be separated from the blocking part by a pressure not higher than a predetermined reference threshold force to make the retainer unable to be pressed in the coupling body unless the tube is inserted in the coupling body so that the annular ridge of the tube is advanced clear of the rib into the coupling body beyond a position corresponding to the inner end surface of the rib.

8. The quick-connect coupling according to claim 7, wherein the retainer has a strength enough to make the retainer unable to be removed from the coupling body by a tensile force not higher than the predetermined reference threshold force in a state where the tube is retained normally in the coupling body by the retainer.

9. The quick-connect coupling according to claim 7 or 8, wherein the reference threshold force is 80N.

10. The quick-connect coupling according to claim 2, wherein a slit is formed between each of the locking legs and the complete connection verifying member adjacent to the locking leg.

11. The quick-connect coupling according to claim 2 or 10, wherein the retainer is a thin, substantially U-shaped member.